Lexical Semantics and Multilingualism

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Outline

➤ Linguistic Ontologies vs. Application Ontologies

• Lexical Semantics

• The Semantic Triangle

• Polysemy and Synonymy

• Multilingualism

Lecture Keywords:

Application Ontologies, Linguistic Ontologies, Lexical Semantics, Semantics, Meaning, Concept, Instance, Multilingualism, Synonymy, Polysemy

الانطولوجيا، انطولوجيا تطبيق، انطولوجيا للغة، الفرق بين انطولوجيا تطبيق و انطولوجيا للغة، علم الدلالة، الدلالة، المعنى، المفهوم، الماصدق، تعدد اللغات، الترادف اللغوي، تعدد المعاني

Application ontology vs. Linguistic Ontology

- The importance of linguistic ontologies is growing rapidly.

- **An application ontology** is a representation of the semantics of a certain domain/application. Such as, the FOAF ontology, the Palestinian e-government ontology, the CContology, etc.
    - Each word convey one concept (no polysemy).
    - Represents application's knowledge and data structure.
    - Used only by a certain application, or a class of applications.

- **A linguistic ontology** is a representation the semantics of all words of a human language, independently of a particular application. Such as WordNet for English.
    - Each word may convey several concepts (Polysemy).
    - Represents common-sense knowledge (lexical semantics).
    - Can be used for general purposes.

➔ Let's first understand the relations between a word and its meaning(s).

Lexical Semantics and Multilingualism

- Application Ontologies vs. Linguistic Ontologies

→ Lexical Semantics

- The Semantic Triangle

- Polysemy and Synonymy

- Multilingualism

What is Lexical Semantics?

The study of how and what the words of a language denote.

- Whether the meaning of a *lexical unit* is established by looking at its neighborhood in the semantic net (by looking at the other words it occurs with in natural sentences), or if the meaning is already locally contained in the lexical unit?

- There are several theories of the classification and decomposition of word meaning, the differences and similarities in lexical semantic structure between different languages, and the relationship of word meaning to sentence meaning and syntax.

Lexical Semantics ➔ focuses on the mapping of words to concepts.

Lexical item: a single word or chain of words that forms the basic elements of a language's lexicon (vocabulary). E.g., "cat", "traffic light", "take care of", "by-the-way", etc.

What is Lexical Semantics?

- There are different theories and approaches in defining the relation between a lexical unit and its meaning. For example: can we understand the meaning independently of a sentence? can we understand the meaning independently of the grammar (morphology)? and so on.

- Such theories and approaches are: Prestructuralist semantics, Structuralist and nostructuralist semantics, interpretative semantics and generative semantics, Cognitive semantics.

- **In this lecture,** we don't investigate these theories, but rather, we study the "meaning" <u>from a computational and engineering viewpoints</u>, so to enable computer applications.

Lexical Semantics and Multilingualism

- Linguistic Ontologies vs. Application Ontologies
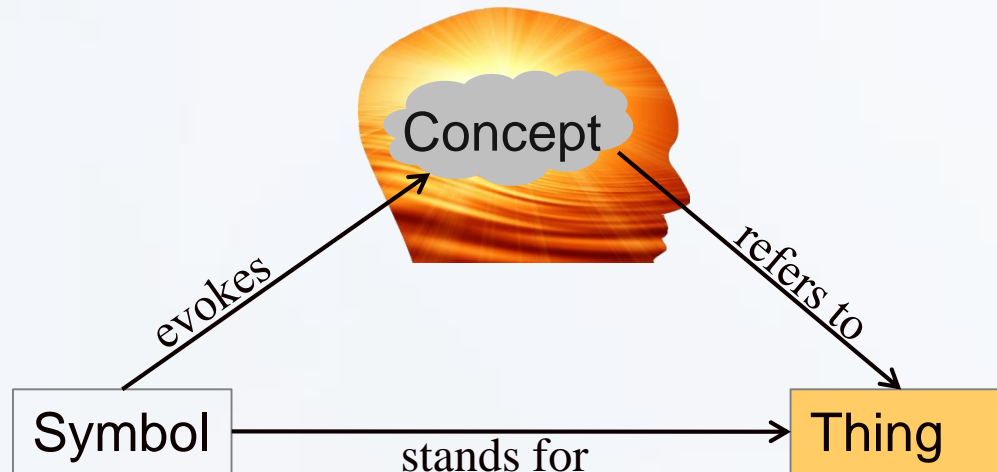
- Lexical Semantics

- The Semantic Triangle

- Polysemy and Synonymy

- Multilingually

The Semantic Triangle

- Humans require words (or at least symbols) to communicate efficiently. The mapping of words to things is indirect. We do it by creating **concepts** that refer to things.

- The relation between symbols and things has been described in the form of the **meaning triangle** (by Gomperz 1908) :

Concept

evokes
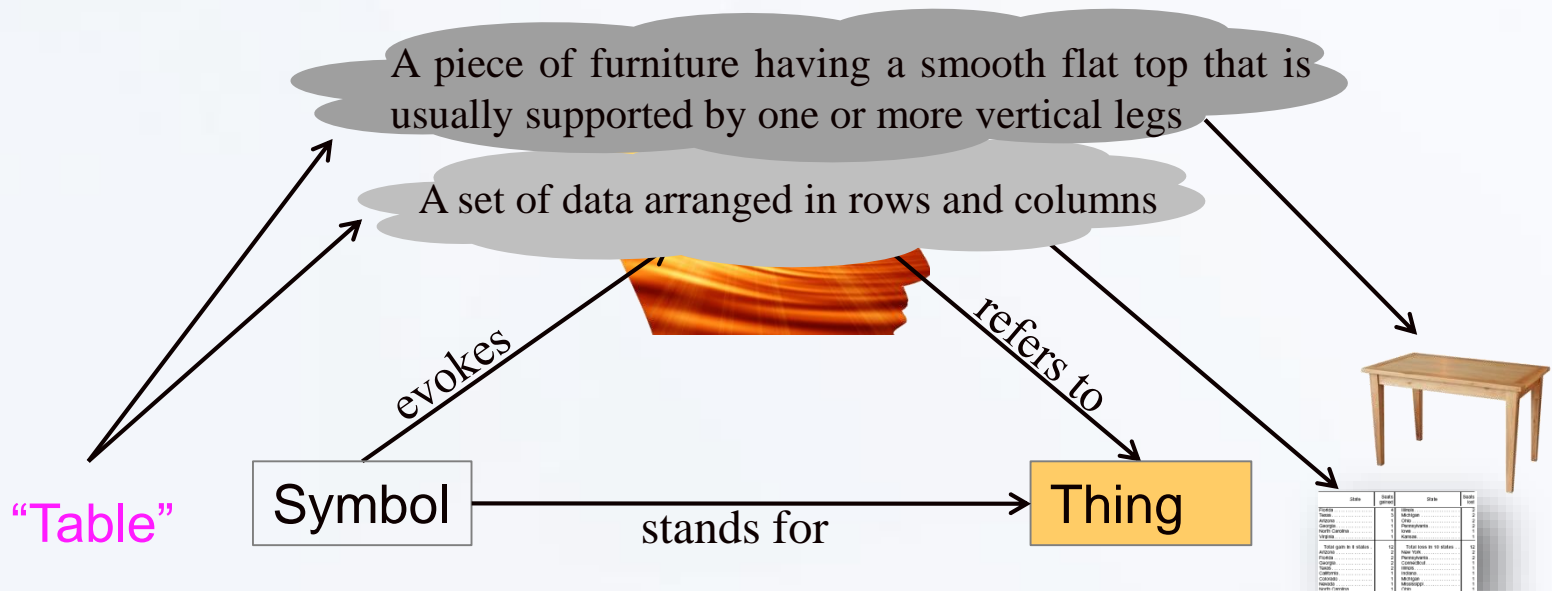
refers to

Symbol

stands for

Thing

The Semantic Triangle

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- The relation between symbols and things has been described in the form of the **meaning triangle** (by Gomperz 1908) :

A piece of furniture having a smooth flat top that is usually supported by one or more vertical legs

A set of data arranged in rows and columns

evokes

refers to

"Table"

Symbol — stands for → Thing

The Semantic Triangle

- Meaning/معنى = Concept/مفهوم = Semantics
- The meaning/semantics of a term is its concepts.

Concept: a set of rules we have in mind to distinguish similar things in reality[J05].

An instance of a concept (المصاد ق)

...of furniture having a smooth flat top that is usually supported by one or more vertical legs

A set of data arranged in rows and columns

"Table"

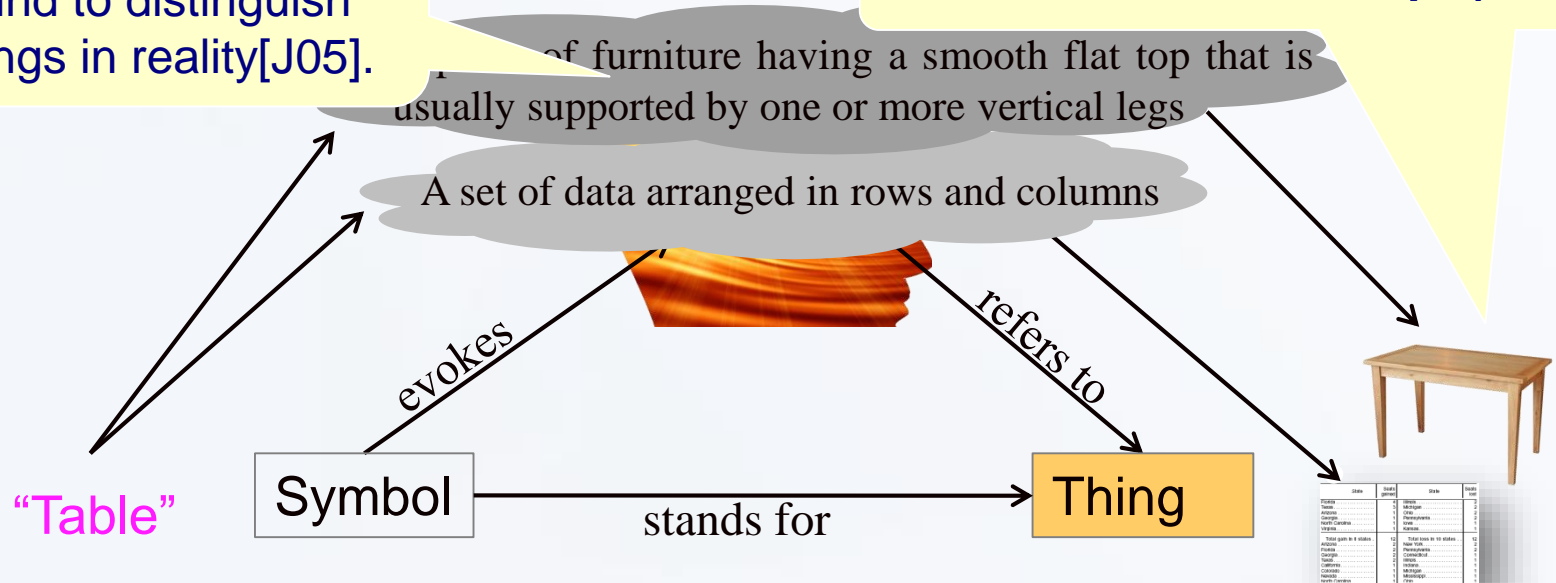Symbol — evokes — stands for — refers to — Thing

The Semantic Triangle

- A concept **might not be agreed** among all people (i.e., not exactly the same set of rules/properties are agreed by all people).

- Thus, "**most common properties**" are used within:

- ✓ **a community of practice** (e.g., professions, or language communities).

- ✓ Large community & less interactions ➔ less concepts are shared.

Concept: a set of rules we have in mind to distinguish similar things in reality[J05].

An **instance** of a concept (الماصدق)

...of furniture having a smooth flat top that is usually supported by one or more vertical legs

A set of data arranged in rows and columns

evokes

refers to

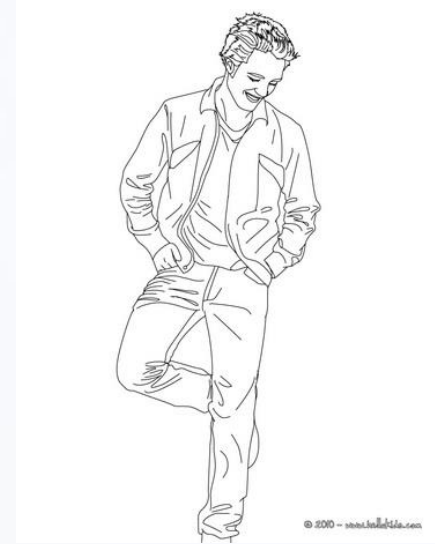"Table"

| Symbol | stands for | Thing |

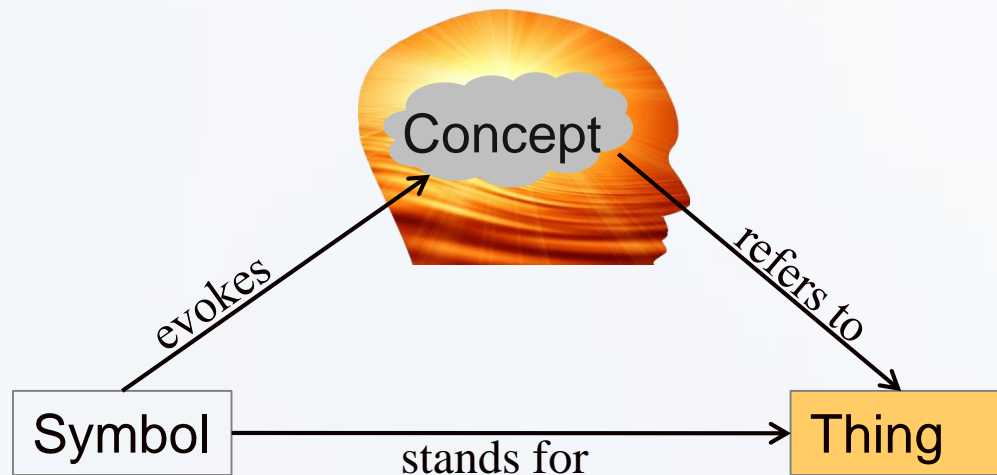# Number of Terms vs Concepts in a Language

قرفصاء

سجود

??

Why there is no word in Arabic to describe this situation?

We give names to the concepts we use more.
Some societies love to give/invite names to concepts (as Arabs in the past)

Concept Vs. Instance

Open Discussion

Recommended Reading

Ḥayy Bin Yaqdhan Novel

Ḥayy ibn Yaqẓān (Arabic: حي ابن يقظان"Alive, son of Awake"; Latin: Philosophus Autodidactus "The Self-Taught Philosopher"; English: The Improvement of Human Reason: Exhibited in the Life of Hai Ebn Yokdhan), the first Arabic novel, was written by Ibn Tufail (also known as Aben Tofail or Ebn Tophail), a Moorish philosopher and physician, in early 12th century Islamic Spain. The novel was itself named after an earlier Arabic allegorical tale and philosophical romance of the same name, written by Avicenna (Ave Cena) in early 11th century,[1] though they had different stories.[2]
-wikipedia
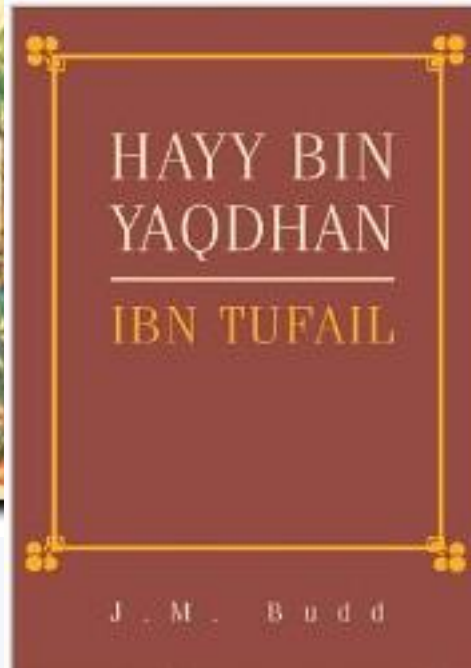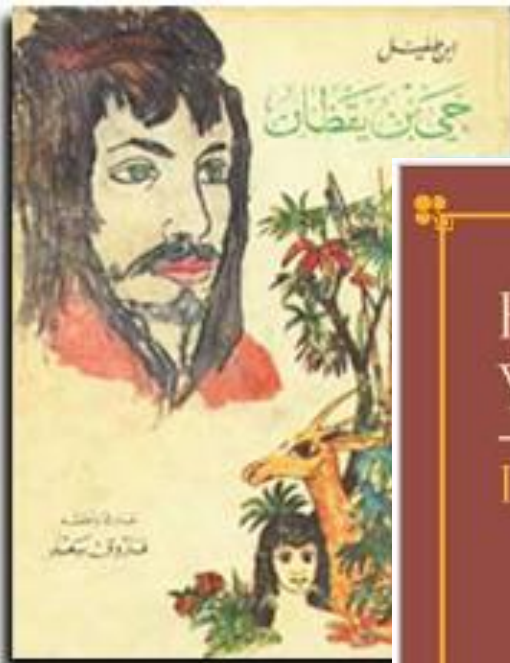
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  Polysemy and Synonymy

- Multilingually

Polysemy

- **Polysemy**: is the capacity of a lexical unit to refer to multiple meanings/concepts. These meanings can be related or different.

- **Polysemy is the consequence of meaning evolution**. The constant discussion over how to name and what words mean is in the discourse of a community and implies language evolution. [3]

- Note: the most frequent word forms are the most polysemous! [4]

Concept: a set of rules we have in mind to distinguish similar things in reality[J05].

An instance of a concept (المصداق)

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Synonymy

- **Synonymy**: Different lexical units denoting the **same concept**

- Two lexical units are said to be **synonyms if they can be used interchangeably** in a certain context.

- Many synonyms evolved from the **parallel use**.

- Some lexicographers claim that no synonyms have exactly the same meaning (in all contexts or social levels of language).

Flat tableland with steep edges

A piece of furniture having a smooth flat top that is usually supported by one or more vertical legs

A set of data arranged in rows and columns

{Table, Mesa}

Table

{Table, Tabular Array}

Symbol

evokes

refers to
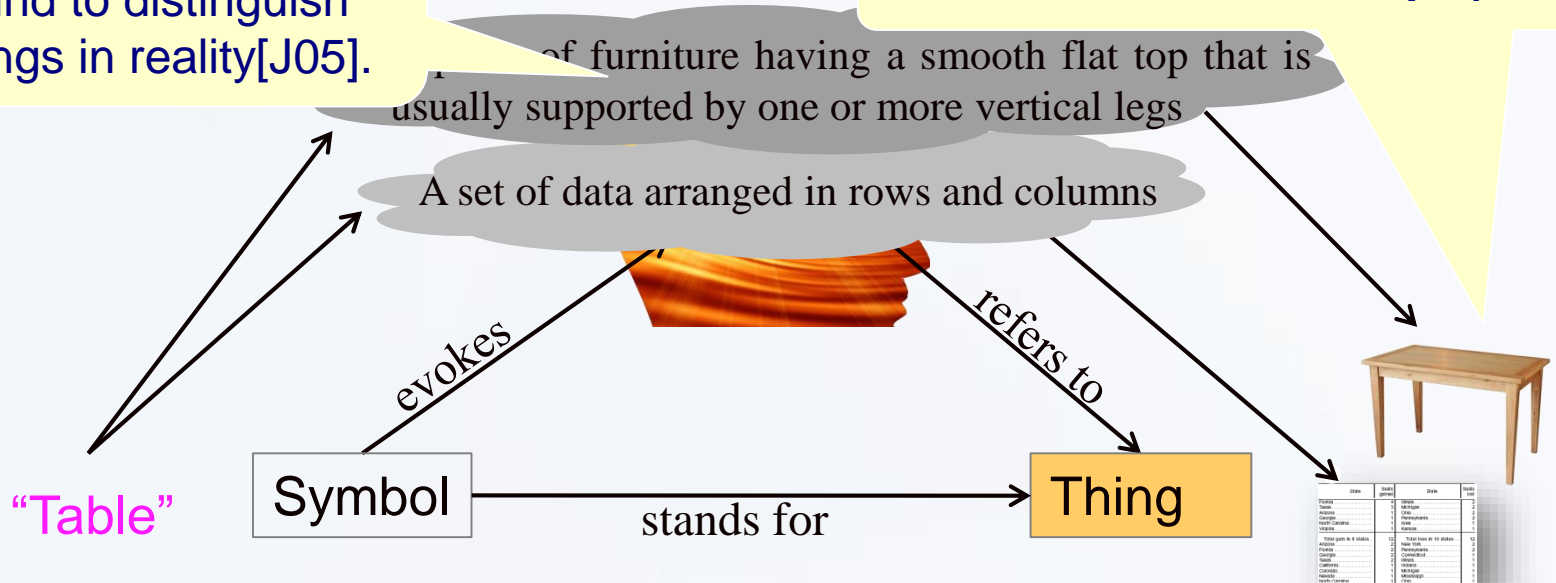
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Multilingually

Multilingually

- Concepts are **not totally language-independent**, as they typically depend on the culture of the language-speakers.

- Many concepts are **shared cross languages**, especially if the speakers of these languages interact with each other.

- **The more interaction** between two communities speaking different languages, **the more shared concepts** can be found.

A piece of furniture having a smooth flat top that is usually supported by one or more vertical legs

A set of data arranged in rows and columns

طاولة

جدول

"Table"

Symbol — stands for → Thing

evokes

refers to

Multilingually

- Concepts are not **totally language-dependent**, as they typically depend on the culture of the language-speakers.

- Many concepts are **shared cross languages**, especially if the speakers of these languages interact with each other.

- **The more interaction** between communities speaking different languages, **the more** Arabic English be found.

Multilingually

- It would nice to know how many concepts are shared between English and French, and Arabic and French/English.

- This would reflect how much the communities speaking these languages interacted in the current and past centuries.

References

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[2]   Davidson, Herbert Alan (1992), *Alfarabi, Avicenna, and Averroes on Intellect: Their Cosmologies, Theories of the Active Intellect, and   Theories of Human Intellect*, Oxford University Press, p. 146, ISBN 0195074238

[3]   Timmerman, Rita. "Questioning the Univocity Ideal. The Difference between Socio-cognitive Terminology and Traditional Terminology." *Journal of Linguistics* 18 (1997): 51-90. Print.

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